LUMBAR PUNCTURE FOR THE REMOVAL OF CEREBRO-SPINAL FLUID.[1]

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THERE are a variety of troubles attended by an increased intracranial pressure, and this often reaches such a degree that relief is imperatively demanded. Brain-tumors, meningitis, hydrocephalus, and perhaps, some traumatic conditions come under this head; and the list might include further disorders if some harmless way of relieving were available. Of course, a radical cure by removal of the cause is the true desideratum, but in this class of cases such permanent relief is rarely attainable. Hence we turn to any measure that can give even temporary amelioration. And this seems to be all that can be justly claimed for the method here to be considered.

In a paper on Hydrocephalus, read before the Tenth German Medical Congress (April, 1891), Quincke described the results obtained by puncturing with a hollow needle and allowing the excess of fluid to run off. This he had practiced in part by boring fine holes through the skull. But he also described and endorsed a method of introducing such a needle in the lumbar region directly through the skin, between the vertebral arches, and tapping the lumbar subarachnoidal space. As the point chosen is below the cord, no serious injury can occur; at most a puncturing of some nerve or small vessel, perhaps. In an adult he had thus in an hour drawn off 80 ccm. of fluid. He recommended this plan for every hydrocephalus with pressure symptoms, especially in the acute forms, whether simply serous, or of tubercular origin. He also suggested subcutaneous slitting of the spinal dura. And this has been done by Paget—in the lower cervical region, however,—as well as practically by others; yet even this more thorough plan gave but transient relief.

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[1] Read before the American Neurological Association, Washington, May 31, 1894.

Several others have reported experience with the trocar-method, Von Ziemssen, perhaps, being its most enthusiastic advocate. My first trial was made a year since. As the results have not been very encouraging, I have done it in but few cases. In one, that of an old hydrocephalus with some exacerbation, there was subjective relief. It was also done in two cases of spinal trouble with evidence of compression of the cord. In one of these (traumatic Pott's disease, corroborated by autopsy), it was with a view to possible relief of the distressing jactation, but to no purpose. In the other, where the trouble had developed suddenly after pleurisy, the puncture was for diagnosis, and at least excluded meningeal hemorrhage.

One case may be worth relating more in detail. This and one other, were in the service of Dr. Bogart at the M. E. Hospital, and it was through his courtesy that I operated.

Boy of eight months, with gradually increasing hydrocephalus. External strabismus on right. Is apparently blind, though pupils react. Fontanelle large and full and approaching sutures open. Some tonic contracture of legs and arms. As he had first developed an irregular fever and some vomiting, it was a question about proceeding, but we decided that interference was all the more warranted. No anæsthetic. The child alternately slept and cried a little during the withdrawal of an ounce and a quarter. The fontanelle gradually sank in and the sutures closed up, except when the child cried. It was noticed that compression of the head (manual) increased the flow.

Extremities—contracture not relaxed. The child's condition was apparently not influenced by the operation. Temperature as before puncture went at times to 105°. He gradually grew worse, became comatose, and died five days later. The fontanelle had not refilled.

Autopsy by Dr. Jelliffe. General congestion of the membranes, with whitish, irregular patches over either temporal apex. Vast clear hydrocephalus of lateral ventricles. It extended freely into the third, and by a short dilated aqueduct into the fourth. This showed a subarachnoidal continuation down spine. On opening over the lumbar cord much free clear fluid was found. No apparent injury from the puncture. The appearance suggested that some of the fluid had escaped through the opening and collected in the extra-dural space.

This was a valuable case. At the time of puncture there seemed to be an acute increase of the hydrocephalus, perhaps a developing meningitis. The fact that pressure on the skull accelerated the outflow, that the fontanelle sank and remained so, and that at the autopsy the fourth ventricle was found to participate and the fluid here to connect with that below, all this shows that the tapping as such was successful. Thus, it was a specially favorable case, because of the good evidence that the pressure of the effusion actually was reduced. And yet the intervention did nothing, either to prolong life or relieve symptoms. In many cases, symptomatically like this, the effusion does not extend into the fourth ventricle even, and then there can be little chance of withdrawing fluid from the cerebral collection through any spinal puncture. The entire failure to relieve in this instance has deterred me from performing it in subsequent cases of the kind.

ACCIDENT.

In one case, a girl of twelve years, with a supposed internal hydrocephalus from old meningitis, after only half a drachm had been secured, the respiration stopped. Narcosis was of course discontinued, and, thanks to the prolonged efforts of the staff, the girl was resuscitated. Possibly a very slight elevation of the head, in the hope of increasing the scant flow, may have favored this occurrence, certainly neither the puncture nor the small quantity withdrawn was thought at all responsible.

DIRECTIONS.

Patient in the recumbent posture on the left side The knees may be drawn up and the spine flexed, giving a curve posteriorly.

An anæsthetic is usually advisable in adults and older children where normal sensation exists. Still, in these cases with increased brain-pressure, there may be more than the usual risk.

Elevating the head has not increased the outflow and, especially if an anæsthetic be used, is not without danger.

Strict asepsis, needle sterilized, etc.

Usually it is easier to go in between the third and fourth lumbar vertebræ. Only once have I succeeded between the fourth and fifth.

A long, firm, smooth aspirating needle (No. 3 French, or from 2½ to 4) answers well. This can easily be connected with a tube for determining pressure if desired. Special needles have been devised, but seem unnecessary.

Enter a little to one side of the median line (Q. says 5 to 10 mm. laterally, though in children he finds it better to pass directly between the spinous processes). As these latter here incline downwards, the tip of the needle on reaching the space selected may be tilted up a little the more readily to enter between.

In my adult cases the length inserted, to the opening in the needle, has varied little from 5 ctm. In children of eight months, and twelve years, respectively, it was only 2½ ctm. Evidently these two figures give about the range of variation (Q. says from 2 to 6 ctm.).

The amount to be drawn off is clearly indicated in each case. It may be allowed to run, or more commonly drip, until the flow spontaneously reduces or ceases. This shows that the pressure is relieved, and yet only within proper limits. There seems to be no danger of air entering. Sometimes the fluid at first comes out tinged with blood collected by the tube in transit, but this then soon gives way to clear, colorless fluid. One csse has been reported with turbid fluid from meningeal inflammation, and in one evidence of hemorrhage (intracranial).

No special precautions are necessary on withdrawing the tube, or in subsequently treating the puncture (iodoform-collodion, if desired).

It is proper, of course, for the patient to lie quiet for a time.

CONCLUSIONS.

1. The method is simple, easily practiced, and rather attractive.
2. In itself it is usually without danger.
3. By it we certainly can draw off cerebro-spinal fluid.
4. The quantity in an adult at short sittings has been from 1 to 1½ ounces.
5. This, without doubt, represents the amount of free fluid usually present in the lower vertebral canal, even when occluded above.
6. In internal hydrocephalus, the relief if any, is but very temporary. In the common form due to tubercular meningitis, the result is not worth the trouble, while in the closed or sacculated forms it must rather do harm than good.
7. As a diagnostic means, *e. g.*, in suspected meningeal hemorrhage, it is valuable. And as an index of pressure it may also be worth noting.
8. It is worth further trial:—(a) as a passing relief in brain-tumors not complicated with hydrocephalus; (b) as a substitute for trephining in progressive dementia; (c) in certain spinal troubles; (d) and possibly as a means of applying medication directly to the spinal meninges.
9. In conclusion it may be said that while admissible in all cases of brain-pressure, there is nevertheless as yet no established indication for this procedure, except for diagnostic purposes.

LITERATURE.

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3. E. Wynter. Four Cases of Tubercular Meningitis in which Paracentesis of the Theca Vertebralis was Performed for the Relief of Fluid Pressure. *Lancet*, 1891, May 2d.

4. O. Wyss. Zur Therapie des Hydrocephalus. *Corresp.-Blatt f. Schweizer Aerzte*, 1893. No. 8.

5. Paget. *Lancet*, 1893.

6. Von Ziemssen and Others. XII German Med. Congress.

An Unusual Case of Hemiplegia.—J. W. Russell, M.A., M.D., M.R., C.P. (*Birmingham Med. Review*, May, 1894), reports the case as a man, aged 48, attacked with hemiplegia, the cause of which could not be definitely decided. There were two unusual conditions present in this patient. First, loss of sense of position in a limb, which, though by no means an unobserved point, is usually supposed to be dependent upon disease of the cortex, and probably of that part of the motor area corresponding to the limb affected. The occurrence in this patient of hemianæsthesia, together with recovery of power in the arm before the leg, shows that the lesion affected the posterior or "ventriculooptec" group of arteries arising from the middle cerebral, and supplying the anterior part of the opticthalamus and neighboring parts of the internal capsule. The second unusual feature was the occurrence of double optic neuritis. According to Gowers, optic neuritis "scarcely ever results from cerebral hemorrhage or thrombotic softening, but it has been observed in softening from embolism, when the source of the obstructing plug was acute endocorditis." "It has also been met in diffuse cerebritis." In this case neither of these conditions were present. A. F.